

# Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase I

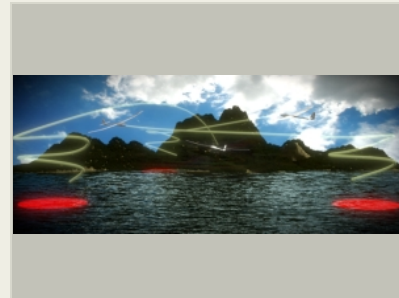
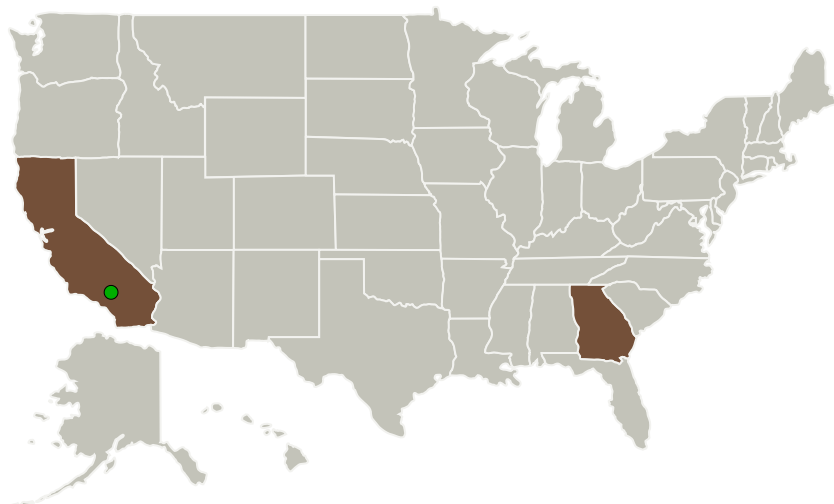
Completed Technology Project (2015 - 2015)



## Project Introduction

Area-I, Incorporated personnel have led the design, fabrication, and flight testing of fourteen unmanned aircraft, one manned aircraft, and numerous advanced guidance, control, and avionics packages. Area-I has continued this tradition in its development of the Resource allocation for Multi-Agent Planning, or ReMAP, guidance and navigation system for unmanned aircraft. The ReMAP system, whose core function is to significantly reduce operator workload by providing mission-driven autonomy to unmanned aircraft in single- and multi-agent scenarios, has already undergone extensive hardware-in-the-loop simulation-based evaluations and the work proposed herein will further mature the ReMAP technology through actual flight-based evaluations on Area-I aircraft. Core capabilities provided by the ReMAP system include: 1) A small, lightweight, inexpensive avionics package that provides real-time mission-driven guidance capabilities to unmanned air vehicles 2) A system architecture that is platform and autopilot agnostic and can therefore be utilized by a wide array of aircraft with varying performance levels 3) A multi-agent planning and control algorithm to allow multiple aircraft to coordinate and thereby maximize mission capabilities and results 4) Aircraft and obstacle avoidance capabilities, including ADS-B In integration, providing autonomous avoidance maneuvers or operator warnings 5) A mission planning toolbox to provide situational awareness and mission management to operators, usable as a stand-alone system or integrated with existing mission planning tools such as NASA's Airborne Science Mission Tools Suite

## Primary U.S. Work Locations and Key Partners



Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase I

## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Images	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

# Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase I

Completed Technology Project (2015 - 2015)



Organizations Performing Work	Role	Type	Location
Area-I, Inc.	Lead Organization	Industry	Kennesaw, Georgia
● Armstrong Flight Research Center(AFRC)	Supporting Organization	NASA Center	Edwards, California

Primary U.S. Work Locations	
California	Georgia

## Project Transitions

**June 2015:** Project Start**December 2015:** Closed out

**Closeout Summary:** Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase I Project Image

**Closeout Documentation:**

- Final Summary Chart Image(<https://techport.nasa.gov/file/138875>)

## Images



### Briefing Chart Image

Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase I

(<https://techport.nasa.gov/image/126295>)

## Organizational Responsibility

### Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

### Lead Organization:

Area-I, Inc.

### Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

### Program Director:

Jason L Kessler

### Program Manager:

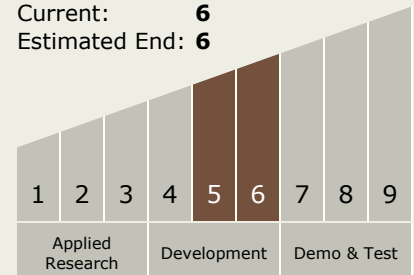
Carlos Torrez

### Principal Investigator:

Daniel Kuehme

## Technology Maturity (TRL)

Start: 5  
Current: 6  
Estimated End: 6



# Flight Testing of Resource allocation for Multi-Agent Planning (ReMAP) System for Unmanned Vehicles, Phase I

Completed Technology Project (2015 - 2015)



## Technology Areas

### Primary:

- TX15 Flight Vehicle Systems
  - └ TX15.1 Aerosciences
    - └ TX15.1.6 Advanced Atmospheric Flight Vehicles

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System